

WHAT IS CLAIMED IS

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1. A data transmission method, comprising the steps of:

a) performing two-dimensional interleaving along a time axis and along a frequency axis;

10 b) transmitting the thus-obtained data by a multi-carrier transmission form; and

c) producing, by channel copy operation, data which is short for the number of channels required for fast inverse Fourier transform

15 performed antecedent to and subsequent to said step a).

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2. The method as claimed in claim 1, further comprising the steps of:

25 d) generating zero points along the time axis equivalently by channel copy operation so as to provide the number of channels required for the fast inverse Fourier transform performed antecedent to said step a); and

30 e) removing the zero points from the result of the fast inverse Fourier transform before said step a).

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3. The method as claim 2, further comprising the step of:

f) performing channel copy operation on

the result of said step a) so as to provide the number of channels required for the fast inverse Fourier transform performed subsequent to said step a).

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4. The method as claimed in claim 1,  
10 wherein the number of channels required for the fast inverse Fourier transform performed antecedent to said step a) and the number of channels required for the same but performed subsequent to said step a) are made equal.

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5. The method as claimed in claim 1,  
20 further comprising the step of:

g) extracting noise at the zero points equivalently inserted along the time axis by the channel copy operation; and  
h) removing noise at signal points of a  
25 reception signal by using the result of said step g).

30 6. A data transmission method, comprising the steps of:

a) performing two-dimensional interleaving along a time axis and along a frequency axis;  
b) transmitting the thus-obtained data by  
35 a multi-carrier transmission form; and  
c) producing, by zero value addition operation, the number of channels which are short

for fast inverse Fourier transform performed antecedent to said step a).

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7. The method as claimed in claim 6,  
wherein the number of channels required for the fast  
inverse Fourier transform performed antecedent to  
10 said step a) and the number of channels required for  
the same but performed subsequent to said step a)  
are made equal.

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8. A data transmission apparatus,  
comprising:

20 a part performing two-dimensional  
interleaving along a time axis and along a frequency  
axis;

a part transmitting the thus-obtained data  
by a multi-carrier transmission form; and

25 a part producing, by channel copy  
operation, data which is short for the number of  
channels required for fast inverse Fourier transform  
performed antecedent and subsequent to the process  
performed by said part of performing two-dimensional  
interleaving.

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9. The apparatus as claimed in claim 8,  
35 further comprising:

a part performing the fast inverse Fourier  
transform antecedent to the process performed by

said part of performing two-dimensional interleaving; and

a part performing the fast inverse Fourier transform subsequent to the process performed by

5 said part of performing two-dimensional interleaving, wherein said part producing the short data by channel copy operation comprises:

10 a part producing data which is short for the number of channels required for said part performing the fast inverse Fourier transform performed antecedent to the process performed by said part of performing two-dimensional interleaving; and

15 a part producing data which is short for the number of channels required for said part performing the fast inverse Fourier transform performed subsequent to the process performed by said part of performing two-dimensional interleaving.

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10. The apparatus as claimed in claim 8, wherein the number of channels required for the fast 25 inverse Fourier transform performed antecedent to said process of two-dimensional interleaving and the number of channels required for the same but performed subsequent to said process of two-dimensional interleaving are made equal.

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11. The apparatus as claimed in claim 8, 35 wherein the number of channels required for fast Fourier transform performed antecedent to a process of performing two-dimensional inverse interleaving

performed at a reception end corresponding to the process of the two-dimensional interleaving and the number of channels required for the same but performed subsequent to said process of the two-dimensional inverse interleaving are made equal.

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10                   12. A data transmission apparatus, comprising the steps of:  
                      a part performing two-dimensional interleaving along a time axis and along a frequency axis;

15                   a part transmitting the thus-obtained data by a multi-carrier transmission form; and  
                      a part producing, by zero value addition operation, the number of channels which are short for fast inverse Fourier transform performed

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                      a part performing two-dimensional interleaving.

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                     13. The apparatus as claimed in claim 12, further comprising a part of thinning out zero values corresponding to the zero values added by the zero value addition operation.

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                     14. The apparatus as claimed in claim 12, 35 wherein the number of channels required for the fast inverse Fourier transform performed antecedent to said process performed by the part performing the

two-dimensional interleaving and the number of channels required for the same but performed subsequent to said process performed by the part performing the two-dimensional interleaving are made  
5 equal.